

For Immediate Release

To: All Media

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Attention: News Editors / Agricultural writers

A New Biocontrol Agent for Mesquite in Africa

The leaf feeding moth, *Evippe* sp. #1 was released into South Africa for the control of invasive *Prosopis* species (mesquite) on 24 February 2021 at the Meerkat Reserve at SKA, and a second release was made in the North-West Province, near Bloemhof on 3 March 2021. More releases will commence in spring, once the insect comes out of diapause.



Background on the problem

Mesquite is particularly well adapted to arid conditions and has an expansive root system, reaching over 50m to tap into ground water. It was widely planted in the arid regions of South Africa, from the late 1800's, mainly for shade and firewood and to use its pods as fodder. Having no natural enemies here in Africa, these species and hybrids have proliferated and became invasive.

It has been demonstrated to have increasingly adverse effects compared to benefits. They reduced plant species density and diversity, increased native tree mortality, reduced the cover of native grass and herbaceous plants (carrying capacity). Furthermore, bare soil was directly correlated to the density of *Prosopis* invasions, and this loss of ground cover under mesquite facilitate soil erosion. Impacts measured during studies on bird and insect community composition in South Africa showed a loss of diversity associated with mesquite invasion. Ecosystem services such as soil quality, grazing and water supply are impacted by *Prosopis* invasions, leading to a range of negative consequences, including to local human communities. These impacts occur across all biomes invaded by mesquite in South Africa, but is more pronounced at high densities. These impacts are also set to increase, as mesquite continues to expand its range and densifies.

Research towards solutions

To retard its rapid expansion, seed-feeding bruchid species were the first natural enemies of mesquite introduced from their countries of origin, following research conducted at the Agricultural Research Council's Plant Health and Protection (ARC-PHP) in South Africa.

Since 2014, the ARC, with generous funding provided by the Department of Environmental Affairs' Natural Management Resource Programmes (DEA: NRMP), amongst others, focused on studying the safety of a potential introduction of *Evippe* sp. #1 into Africa. This new biocontrol candidate, a species of gelechiid moth, belonging to the genus *Evippe*, originally from Argentina, was found safe for release in Australia and introduced there in 1998. It proved to be their most successful biocontrol agent of mequite. Our studies confirmed that *Evippe* sp. #1 was only able to develop to adulthood on the invasive alien *Prosopis* species and their hybrids, and not on related African species. Therefore, the Department of Agriculture, Land Reform and Rural Development of the Republic of South Africa granted permission for the introduction of *Evippe* sp. #1 as biocontrol agent of mesquite here, on 21 December 2020.

What to expect from *Evippe* sp. #1

The feeding of the developing immature stages of the moth is causing the damage to the mesquite. A female moth lay about 75 eggs on the trees throughout her two- to three-week lifespan. The first instar larva of *Evippe* sp. #1 mines in a pinna of a mesquite leaf, whilst larger larvae feed externally in a shelter created by tying a few pinnae of a leaf together, using silk threads. These can be easily observed on the trees. Entire stands of mesquite may be repeatedly defoliated, which reduce its fitness and invasiveness and may kill stressed trees. The moths entire lifecycle can be completed in less than 45 days and can complete several generations in a year, to build up to high numbers, before diapause in winter.

Evippe sp. #1 is anticipated to establish widely in Africa, and could disperse well unaided, based on experience in Australia. These insects, and biological control in general, coexist in their countries of

origin on the trees that are maintained at much lower densities, than here, where the trees have become invasive. A reduction in plant densities is thus a likely scenario, rather than eradication of mesquite. Lower densities add value to the plants in the field as it limit the impact caused by high plant densities, whilst simultaneously, greater value are derived from sparser trees.

Ends

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Notes to the Editors

About the Agricultural Research Council

The Agricultural Research Council is a premier science institution that conducts research with partners, develops human capital and fosters innovation in support of the agricultural sector. The ARC provides diagnostic, laboratory, analytical, agricultural engineering services, post-harvest technology development, agrochemical evaluation, consultation and advisory services, food processing technology services as well as various surveys and training interventions. For more information visit the ARC website at: www.arc.agric.za.